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ABSTRACT

The passage of the Kentucky Education Reform Act (KERA) in the 1990s made Kentucky one of the first states to initiate comprehensive education reform. It established a legislatively mandated goal that all public schools reach "proficiency" (100 of 140 points) on an accountability index by 2014. This paper tries to predict which schools in the state will reach proficiency. In 2001, with 9 years of accountability concluded, 162 schools had garnered at least 80 points, 543 had at least 70, and 1,009 schools had at least 60 points. Although a simple summation of yearly gains indicates that most schools will meet the 100-point goal, major changes in the accountability system make it difficult to estimate how many schools will make it. The report looks at three different ways to predict school achievement: method A accepts the past and assumes the future will be a linear extension; method B assumes a huge increase evident from 1998 to 1999 was an aberration and excludes that year in making projections; and method C uses a 7-year average and adds this to a base score. Relying on method C as the more reliable predictor, the report concludes that, unless the accountability system is changed once again, most schools will not reach the 100-point minimum by 2014. (Contains 10 references and 3 appendices that contain forecasting scores for successful schools.) (RJM)

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THE KERA ENDGAME:
WHICH KENTUCKY SCHOOLS WILL ACHIEVE PROFICIENCY BY 2014?

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by

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SUMMARY

Kentucky, one of the first states to initiate comprehensive education reform in the 1990s, has a legislatively mandated goal that all public schools reach 100 of 140 points or "proficiency" on the accountability index by 2014. Several methods for projecting accountability scores in 2014 are compared for all Kentucky schools and for urban schools in the two largest school districts in the state (Jefferson and Fayette). Although projecting school performance so far into the future increases the likelihood of substantial estimation errors, the most realistic method projects that somewhat less than half of all Kentucky schools and only one-third of urban schools will likely reach the minimum goal of 100 points by the 2014 deadline. This preferred method projects that statewide no more than about 500 schools, and in Fayette and Jefferson Counties no more about 60 schools will achieve the 100 point minimum, unless prior to 2014, the General Assembly and the KDE make another major accountability system change comparable to the change from KIRIS to CATS in 1999. The 269 schools across the state that appear almost certain to achieve proficiency by 2014 (they are projected to reach 100 or more points using all three methods) are listed in Appendix A. The 59 urban schools that are projected to achieve the minimum score using the preferred method are listed in Appendix B.

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EDUCATION ACCOUNTABILITY IN THE STATES

Although all American states have joined the growing movement to hold public schools more responsible for their performance, they vary considerably in their approaches to school accountability. Advocates of American federalism contend that this is the genius of the system – major complexities and unknowns in the policy area of education as well as diversity in state and local social and economic conditions require experimentation and varied approaches to policy problems. Critics of this highly decentralized system argue that substantial resource inequality across jurisdictions as well as variations in performance require greater control by the national government. Centralized control is necessary to establish consistent, high standards and to provide increased and more equitable resources necessary to achieve a truly internationally competitive system of public education in this country. These two perspectives on federalism and public education are contested continually in the legislative and judicial arenas.

The diversity of American public education and systems of accountability is documented by Education Week in their yearly evaluation titled "Quality Counts 2001: A Better Balance." As evidence of standardization and uniformity, the study finds that 49 states have developed statewide academic standards in at least some subjects, and 50 states test student learning in some way. As evidence of diversity and inconsistency, only 27 states hold schools responsible for results either by rating the performance of all schools or by identifying low performing schools. http://www.edweek.org/sreports/qc01/ Of these 27 states holding schools accountable for performance, 11 base their ratings entirely on test scores. The remaining 16 states include other factors such as school attendance and dropout rates, but in most cases these non-test factors are not heavily weighted components of the overall ratings. Also, of these 27 states that hold schools accountable for performance, 18 evaluate school improvement over time and 19 require schools to meet an absolute standard, and some do both. In addition to the Education Week report, examination of state education department websites confirms the varied approaches to school accountability taken by the states.

Components of this Education Week index or grade for accountability and standards include whether the state has adopted standards in core academic subjects, and whether its rates schools, and provides rewards, sanctions, and assistance. Of the top states in the Education Week assessment of standards and accountability, Maryland, New York, Kentucky, and New Mexico received grades of A or A-, while Massachusetts, North Carolina, and South Carolina received grades of B+. Six states (Tennessee, Minnesota, Rhode Island, North Dakota, Montana, and Iowa) received failing grades of F. The websites of state education agencies also provide information that helps document the wide variety of accountability systems. As one of the top school accountability systems in the study, North Carolina's ABCs system sets growth and performance standards for elementary, middle, and high schools using end-of-grade and end-of-course tests in a variety of subjects. The end-of-grade tests are curriculum-based multiple-choice standardized achievement tests based on North Carolina standards aligned with national curriculum standards. Schools that reach specified levels of growth and have certain numbers of students performing at or above grade level are eligible for incentive awards. There are several categories of performance ranging from Schools of Excellence through

Low-Performing Schools, but approximately 70% of schools met either expected or exemplary growth standards in 2000.

Another top-rated system, New Mexico evaluates schools and districts on five indicators including student achievement, attendance, dropout, safety, and parental involvement as well as indicators of appropriate expenditure of funds, and meeting additional state and federal regulations. Categories of performance range from Exemplary through Disapproved with 84 percent of schools meeting or exceeding standards in 2001. Maryland created the Maryland School Performance Program (MSPP) in 1989 with an accountability system that sets standards in student achievement, dropout, and attendance rates. The student assessment program (MSPAP), tests students annually in grades 3, 5, and 8 with plans to extend the system to high schools in the near future. The system uses gain scores to determine levels of performance and possible financial rewards with 61 elementary and middle schools recognized for making significant improvements over two to three years through 2000 and receiving monetary rewards and another 293 schools recognized for making one-year gains but receiving no monetary awards. Even with the Education Week summary and evaluation, it is difficult to briefly describe and clearly categorize the many variations in state education accountability systems that have developed over the past decade or more. The next section describes the Kentucky accountability system that shares some similarities to other state systems, but also exhibits certain unique features.

KERA'S OPERATIONAL GOAL: 100 POINTS BY 2014

Kentucky is one of the few state systems that not only rates schools based on performance over time, but also has an ultimate, operational goal for school performance. The goal for all schools is a clear standard that must be achieved within a designated time limit in order for the school to be judged successful or proficient. Kentucky, one of the first states to initiate a comprehensive education reform program in the 1990s, has a legislatively mandated goal that all public schools reach 100 of 140 points on the accountability index by the year 2014. A score of 100 points is considered to be proficient, one of the four performance levels on the scale ranging from novice through apprentice, proficient, and distinguished. Not only are all schools expected to reach 100 points by 2014, they are evaluated and classified every two years based on their progress towards this minimum goal.

Each Kentucky school now has a growth chart that uses a straight line to project from their baseline score in 2000 to the goal of 100 points in 2014. http://apps.kde.state.ky.us/cats_reports/ Schools that score above the goal line at each two-year interval are considered to be meeting their goal and receive monetary rewards. Schools that score below the goal line but are above what is called the assistance line are considered to be progressing and are eligible for a lesser level of reward as long as they score above their previous baseline score. Finally, schools that score below the assistance line receive no rewards and the lowest one-third of these schools must undergo a scholastic audit to determine how much and what type of assistance is needed. The remaining schools below the assistance line undergo other types of reviews. In addition to accountability scores, in order to receive rewards schools must meet certain other targets for reducing their dropout rates and their proportion of students classified as novice.

Before considering alternative forecasts of the performance of Kentucky schools in the ultimate accountability year of 2014, it is important to understand some of the difficulties in projecting organization behavior, especially far into the future. Regardless of the subject, forecasting is always risky business, especially when attempting to project behaviors more than a few years or even a few months into the future. Weather forecasters develop complex models with extensive data designed to analyze many interrelated variables as they attempt to predict weather accurately days or even hours in advance, let alone weeks or months in advance. Economists also have developed complex models to predict aggregate economic behavior, often with little success, especially when projecting far into the future. Experts in time series analysis caution that projections more than a few data points into the future are likely to be characterized by large estimation errors making them very unreliable predictions of future behavior, especially when unexpected events occur outside the boundaries of the model. A recent example is the September 11 terrorist attack on the U.S. and its substantial but largely unknown effects on the nation's economy and other social systems and political institutions. As will be shown below, despite the popular image of relatively stable and conservative organizations reinforced by the reality of considerable stability in the actual performance of Kentucky's schools, predicting the behavior of these coping organizations (Wilson, 1989) is neither simple nor certain, especially beyond a one or two-year period.

ASSUMPTIONS ABOUT SCHOOL PERFORMANCE

This analysis of Kentucky school accountability begins with three assumptions. First, it is assumed that the performance of individual schools does not change substantially from one year to the next - - most yearly changes in accountability scores fall within a limited range. Second, aggregate school performance is moderately to highly correlated from one year to the next -- the rank order of school performance is relatively stable from year to year; and third, although subject to error (random and systematic), reasonably accurate projections of future school performance can be made based on past performance. The third assumption regarding projections is the primary subject of this paper and will be examined in some detail, however projections of future behavior depend to a great extent on the reasonableness or validity of the first two assumptions.

Table 1 describes accountability change scores from 1993 through 2001 and with one exception provides much support for the first assumption. Except for the extraordinarily large gain in scores from 1998 to 1999, most yearly changes in accountability scores fall within a limited range and are distributed relatively consistently over time. There are few exceptionally high increases or decreases in scores from year to year. The unusually large increase in accountability scores from 1998 to 1999 will be examined in more detail below.

TABLE 1 CHANGES IN SCHOOL ACCOUNTABILITY SCORES								
	YEARLY CHANGE SCORES							
	93-94	94-95	95-96	96-97	97-98	***98-99***	99-00	00-01
Total n	1156	1130	1180	1161	1173	***1169***	1186	1192
Mean ch	5.7	4.0	-1.4	4.3	-0.5	***16.8***	1.9	2.5
S.D.	6.4	6.0	5.6	4.9	4.3	***5.7***	4.0	4.2
Min	-15.7	-19.5	-31.0	-16.2	-28.8	***-10.0***	-16.3	-15.2
Max	51.4	33.9	26.5	21.7	17.6	***38.5***	21.4	25.9
>0	970	856	428	959	506	***1166***	819	872
>5	584	469	127	499	96	***1142***	212	270
>10	237	148	26	126	12	***1031***	35	52
>15	86	41	10	17	2	***733***	4	10
<0	178	270	746	197	651	***3***	358	308
>-5	25	53	269	41	135	***1***	39	31
>-10	8	11	46	9	19	***0***	4	2

Table 2 shows that after the earlier years of KERA when one might expect much diversity and unpredictability as schools struggle to adjust to a new system of accountability, aggregate school performance is related closely from year to year. Beginning in about 1996, the rank order of school performance begins to display moderate to strong stability culminating in the very high correlations for school performance in 1999 and 2000 (r = .92) and in 2000 and 2001 (r = .91). These strong correlations show that in the late 1990s and in the early 2000s, schools have settled into a relatively stable pattern of performance – higher scoring schools continue to score higher while lower scoring schools continue to score lower. Very few schools are now making comparatively major gains or declines in performance such that they would leap ahead or fall behind many other schools and weaken the correlations in scores from one year to the next.

TABLE 2 SCHOOL ACCOUNTABILITY SCORE CORRELATIONS *								
	1993	1994	1995	1996	1997	1998	1999	2000
1993								
1994	.56							
1995	.54	.68						
1996	.54	.62	.71					
1997	.58	.59	.62	.75				
1998	.52	.58	.58	.69	.84			
1999	.60	.56	.61	.69	.75	.82		
2000	.58	.52	.57	.67	.73	.78	.92	
2001	.54	.50	.56	.67	.72	.75	.85	.91
* N's range from 1047 to 1192								

SCHOOL PERFORMANCE

Before considering alternative forecasting methods to project future school performance, the current status of Kentucky schools relative to the goal of 100 points and proficiency is examined. What are the scores of the approximately 1200 schools in 2001 as they face 13 more years of work to reach the goal of 100 points? As of 2001, with nine years of accountability concluded (eight yearly changes) and with thirteen years remaining to the deadline in 2014, 162 schools have reached at least 80 points, 543 schools have reached at least 70, and 1009 schools have reached at least 60 points. In addition, four schools (two from one small school district) have already reached the minimum of 100 points and thirty schools have reached 90 points and higher. Although these scores in 2001 look very promising for future success, how might projections of future performance be made?

To make an initial but somewhat misleading projection based on a simple assumption, suppose Kentucky schools on average gain 2.5 points each year from 2001 to 2014. If this occurs, one could expect that on average most of the 543 schools that have reached 70 points by 2001 would attain the necessary minimum by 2014 (13 x 2.5 = 32.5 + 70 = 102.5 points). Recognizing that this assumption might bring somewhat less than half of Kentucky's schools to the minimum standard, is 2.5 points per year of average gain a reasonable assumption?

Since the average yearly change from 1993 to 2001 for all schools that existed throughout the period is 4.1 points (33 points divided by 8 yearly changes), the assumption of 2.5 points per year seems very conservative, suggesting that a substantial majority of schools should reach the minimum score by the deadline. If one takes the average yearly change from 1993 to 2001 for each school and multiplies this figure by 13 (years to 2014), then adds this number to each school's score in 2001 (the current base year), 917 of 1078 schools that existed in 1993 and have continued through 2001 are projected to reach or surpass 100 points by 2014. [Schools that have closed, merged, or opened since 1993 are not included in this calculation.] This is probably the simplest projection in that it takes school performance over the past 9 years and projects that performance 13 years into the future. This method also results in a high level of success in that approximately 8 of 10 schools are projected to reach the minimum goal of proficiency by the deadline year.

Before accepting the assumptions and calculations of this simple method with its projection of a relatively high proportion of successful schools, the data in Table 3 raise several questions. The table shows that the average gain of 4.1 points per year from 1993 to 2001 masks a wide range of variation from year to year. For example, scores increased an average of 11.7 points from 1998 to 1999 (before adjustments to 1999 scores made in 2001), but decreased 1.4 points from 1995 to 1996 and a half point from 1997 to 1998, indicating that the pattern from 1993 to 2001 is not regular, incremental increases over time. This apparent lack of trend combined with the unusually large gains made in 1999 suggests alternative ways to calculate and compare projections based on school performance over the nine years of testing.

TABLE 3
KERA ACCOUNTABILITY SCORES OVER TIME

YEAR	N	MEAN	MIN – MAX	AVG CH/YR
1993	1158	35.9	19.1 – 69.8	
				5.70
1994	1186	41.5	24.6 – 76.5	
				4.02
1995	1180	45.6	25.1 – 79.6	
				- 1.43
1996	1181	44.2	24.2 – 75.6	
				4.30
1997	1145	48.4	27.6 – 80.9	
				- 0.48
1998	1179	48.0	25.1 – 77.4	
				11.72
1999*	1207	59.7	33.3 – 88.7	
1999 (adj)**	1184	64.9	35.9 – 99.2	16.84 (adj)
2000	1217	61.1	35.6 – 94.5	
2000 (adj)**	1192	66.7	36.9 – 103.2	1.86 (adj)
2001	1210	69.1	39.7 – 106.9	2.46 (adj)

* In 1999, the accountability system changed from KIRIS to CATS.
** In 2001 the accountability scores for 1999 and 2000 were adjusted to reflect changes in standards

At least three things stand out in comparing the changes in accountability scores from 1993 to 2001 presented in Table 3. First, as might be expected, schools on average made substantial gains in the first two years of accountability -- a 16 percent increase (5.7 points) from1993 to 1994 and a 9.6 percent increase (4.0 points) from 1994 to 1995. There are several possible explanations for this initial strong performance, but two that seem most likely are (1) testing experience or learning – schools (students and teachers) learned much about the accountability tests over the first two years of experience (the learning curve was steep initially), and/or (2) some schools in 1992/1993 may not have tried to establish a strong initial score knowing that this score would serve as the baseline for measuring change over time and these gains or declines would lead to future rewards or penalties.

The next noteworthy characteristic of these data is the size of the average change score from 1998 to 1999. The increase of 11.7 points or almost 25 percent in one year (prior to an adjustment made in 2001) is more than double the next highest increase that occurred in the first year from 1993 to 1994. The third characteristic of the data, also related closely to the large gain in scores in the 1998/99 academic year is the adjustment of 1999 and 2000 scores made in 2001. With these latest adjustments, the mean score in 1999 increases from 59.7 to 64.9 points and the mean score in 2000 from 61.1 to 66.7 points. The change from 1998 to the adjusted 1999 scores has now become a substantial 16.8 point increase or an average gain of 35 percent in one year. The change from 1998 to the adjusted scores in 2000 has now become an increase of 39 percent or an average

gain of about 20 percent each year from 1998 through 2000. There may be other plausible explanations for these dramatic increases in 1999 and 2000 scores, but the major change in the accountability system from KIRIS to CATS implemented by the KDE in 1999 and the additional scoring adjustments made in 2001 stand out as the most likely reasons for the large increases.

WHAT HAPPENED TO ACCOUNTABILITY IN 1999 AND 2001?

The short answer to the question of what happened in 1998/99 is that the Kentucky General Assembly and the Department of Education changed the accountability system from KIRIS to CATS. Appendix C includes a summary timeline for the KERA accountability system in the period 1997 through 2001 that highlights some of the changes made in the transition from the original KIRIS testing system to the CATS system initiated in 1999.

After about 7 years of KERA and 5 years of accountability and testing, policy makers faced several highly contentious issues. These included whether a national, standardized or norm-referenced test should be used along with or instead of the custom-made tests based on specific content and standards developed by state educators, the use of rewards as salary bonuses to staff, the types of sanctions imposed on poorly performing schools, and whether each school should have a fixed improvement goal. A Task Force examined these and other issues and issued a 1998 report that recommended using a national standardized achievement test, increasing the emphasis on basic academic skills, simplifying school achievement goals, prohibiting cash rewards used as bonuses for teachers, and developing a school report card (Harp, 1997).

At about the same time, a report from a group of national testing experts commissioned by the Legislative Research Commission criticized the KIRIS accountability system and recommended a new process be initiated to reestablish a baseline year and reset accountability standards as soon as possible (Blackford, 1998). Towards the end of the 1998 legislative session, the General Assembly approved HB 53 requiring that a new Commonwealth Accountability Testing System (CATS) replace the previous KIRIS system and include a norm-referenced test, open-response and multiple-choice items, writing portfolios but with reduced time for students and teacher involvement, and more participation of teachers in designing and scoring the new tests. The legislation also required the establishment of a school report card, reconfigured the consequences section of accountability, and required the State School Board to establish a new formula for accountability and school improvement.

A School Curriculum, Assessment, and Accountability Council was appointed to advise the state School Board on further development of the new state testing system including whether the test should be designed to provide reliable scores for individuals students, schools, or both; the mix of multiple-choice and essay questions; and how much of the test would be customized for Kentucky or consist of national standardized test items (Harp, 1998). In June 1998, the state school board approved an RFP for a contractor to build a new accountability test and in September awarded CTB/McGraw Hill a four-year $30 million contract to design and score CATS as the replacement for KIRIS accountability system.

In late 1998, the state school board proposed a new system to evaluate and classify schools. The heart of the new system is a "line of expected growth" that is

plotted for each school showing how it must progress from 2000 to reach the goal of 100 points by 2014. http://www.kde.state.ky.us/comm/commrel/cats/long_term.asp Every two years, a school will be classified as meeting its goal, progressing, or needing assistance. In early 1999, based on recommendations from The National Technical Advisory Panel on Assessment and Accountability and WestEd, the assessment subcontractor for the Kentucky Core Content Tests, that the core content be reviewed prior to the development of new questions, committees begin benchmarking (aligning to national standards) in five content areas and in April 1999, the first CATS test was taken. After two years of testing and accountability using the CATS system, recalculated scores for 1999 and 2000 were released in August 2001 in the form of growth charts for each individual school. Although the major change in the accountability system occurred in 1999 when the system changed from KIRIS to CATS, as shown in Table 3, further adjustments made in 2001 to 1999 and 2000 CATS scores are also substantial. The current Commissioner of Education contends that the "new student performance standards came from the most comprehensive standards-setting process ever undertaken by any state-level education testing system" (Wilhoit, 2001).

This major change in accountability systems raises the question of whether it is reasonable to use pre-1999 scores in longitudinal models to project future performance. Does the new accountability system and revised achievement test make comparisons of school performance before and after 1999 suspect or invalid? This is a reasonable question, but I note that the accountability scale remains the same throughout the period (0-140 points), different groups of students and different grades have taken the tests throughout the entire period, and there were many adjustments in the accountability system prior to 1999. I believe it is reasonable and informative to use the earlier scores and although the 1999 change accomplished many important and perhaps necessary goals, I contend that the primary result was to raise the baseline score substantially for almost all schools. As the following sections show, school performance data from 1993 through 1999 provide important and useful information that helps understand how schools performed in the past and possibly might perform in the future. Arguing that these earlier scores are not valid measures of organization performance or pretending they don't exist seems unreasonable and short-sighted.

ALTERNATIVE PROJECTIONS OF SCHOOL PERFORMANCE

Given the unusually large average increase in scores in 1999 (including the 2001 adjustments), an alternative to the projection method described previously is to ask what might the average gain be without the huge one-year increase in 1999 that accounts for about half of the total average increase of 33 points from 1993 to 2001? For example, if one takes the average yearly change for each school that occurred prior to the major system adjustment in 1999 (1993-1998) and multiplies this figure by 16 years (1998 to 2014), then adds this figure to each school's score in 1998, only 317 schools would be projected to reach the goal of 100 points by 2014. This projection is labeled Method B and can be compared to the previous method labeled Method A in Table 4.

Comparing Method A to Method B in Table 4 shows that the system adjustment in 1999 is likely to have a huge positive impact on school performance over the next 1½ decades. Given certain assumptions, this change in 1999 could mean the difference between only about one of three schools reaching the overall goal compared to about four

of five schools reaching the goal (917 versus 318 schools). However, even if as some critics suggest, the 1999 scores do not indicate real learning or true school performance and therefore artificially inflate average change scores from 1993 to 2001, since the large gain in 1999 is unlikely to be adjusted down between now and 2014, Method B is not realistic and is useful only as an analytical comparison. Regardless of questions about the statistical, methodological, or pedagogical legitimacy of the huge overall increase in accountability scores in 1999 (and the additional adjustments made in 2001), there seems to be little or no possibility that the scores for that year will ever be adjusted downward. Given political and policy realities, an alternative projection method that combines elements of both Method A and Method B may provide a more realistic and accurate projection of school performance.

The third example of a projection of school performance, labeled Method C in Table 4, accepts that the huge overall gain in 1999 scores is now a permanent part of the baseline for each school, but does not use the exceptionally large increase from 1998 to 1999 to calculate yearly averages for projections. Even with the inclusion of the large average gain in 1999 and the later adjustments to 1999 and 2000 scores leading to the average score of 69.1 in 2001, if one assumes that the average gain per year would more likely be that of the other 7 year changes (omitting the large gain of 16.8 points from 1998 to the adjusted 1999 scores), then the average change score in this period is 2.34 points. When the average yearly gain for reach school using this method is multiplied by 13 years and added to the 2001 score of each school, 483 schools are projected to reach the goal of 100 points by 2014.

TABLE 4
PROJECTIONS OF 2014 ACCOUNTABILITY SCORES *

	METHOD A	METHOD B	METHOD C
Trend Years	1993-2001	1993-1998	1993-1998 +1999-2001
Avg Yearly Change	4.12	2.40	2.34
Base Year for Projection	2001	1998	2001
Mean Score 2014	122.5	86.4	99.3
# Schools 100+ pts in 2014	917	318	483
# Schools 98+ pts in 2014	937	339	513
# Schools 140+ pts in 2014	232	34	41
# Schools < 80 pts in 2014	16	455	188

* The data are for all Kentucky schools with N's ranging from 1047 to 1085 depending on projection method, and using 1999 and 2000 scores as adjusted in 2001.

This third alternative (Method C) accepts that the system change made in 1999 cannot be assumed away as in Method B, however it does assume that the more realistic future pattern of accountability scores should ignore the huge gain in scores from 1998 to 1999 and use a seven-year instead of eight-year average. With this method, the current year 2001 base is accepted (keeping the adjusted scores from 1999 through 2001) but the average projected gain from 2000 to 2014 is based on average change from 1993 to 1998 and from 1999 to 2001 (seven instead of eight years). This method projects that

somewhat less than half (45 percent) of Kentucky schools are likely to reach the goal of 100 points by 2014. It should be emphasized that these forecasts are based on schools that existed and continued through 2001. Although some schools in 1993 no longer exist and new schools have been added since 1993, there are not sufficient numbers of these schools to make any noticeable difference in the overall projections of successful schools using these three methods. However, a cursory examination suggests that the newer schools are performing at higher levels than most of the schools that closed or were merged, so the final count of successful schools would likely be somewhat higher than projected in Table 4.

To summarize the three projection methods, Method A accepts the past and assumes the future will be a simple linear extension of that past (8 years are used to predict the next 13 years). Method B assumes the huge increase from 1998 to 1999 is an anomaly due to a major policy intervention in the accountability system and leaves out that year in projecting the future (5 years are used to predict the next 16 years). Method C leaves adjusted 1999 scores in the base total for 2001, but uses a 7 year average (omitting the large gain in 1999 to calculate a seven year average gain score) and adds this projected trend to the current 2001 base to project to 2014. Another way to think about Method C is that the high proportion of schools achieving the goal of 100 points and higher based on Method A (about 80 percent) is not likely to occur without another major policy intervention in the accountability system sometime before 2014, or the highly unlikely occurrence of an exceptionally large average real gain in scores sometime between 2001 and 2014.

To provide additional information, Appendix A lists the schools across the state that reach the minimum score of 100 points by 2014 using all three projection methods. These 269 schools can be viewed as the consensus successes and are most likely to meet the minimum standard, however as Table 4 indicates many other schools are projected to reach the minimum using Method C and especially Method A. The data indicate that the three methods with differing assumptions can have substantial impacts on projected future scores. Some schools display differences of 30 to 40 points from one method to another in projected scores in 2014. Another point to make about the three methods is that the most "liberal" projection (Method A) predicts that many of these successful schools will score above the maximum of 140 points in 2014. Table 4 shows that 232 of 1078 schools are projected to score above 140 points using Method A. This is further evidence that simply projecting the next 13 years based on the past 8 years may be misleading or too liberal.

As an additional piece of information, the projected scores in 2014 using the three methods are moderately to closely correlated. The correlation for scores based on Methods A and B is .62; for Methods A and C, it is .90; and for Methods B and C, it is .75. Although the absolute values of projected scores for each school may vary substantially depending on the projection method, the relative ranking of performance for these schools does not change very much depending on the method used.

ONE-PERIOD-AHEAD FORECASTS

To provide further comparisons of these three methods that project far into the future, I use similar methods to project actual scores in 1999, 2000, and 2001 (one-period-ahead forecasts). Tables 3 and 4 above use existing data (yearly accountability

scores from 1993 through 2001 including the adjustments made in 2001 to 1999 and 2000 scores) to project future behavior that is unknown (accountability scores in 2014). Ostrom (1990: 77) uses the term *ex-ante*-forecasts for models that project into the unknown future and compares these to *ex-post*-forecasts that use part of an existing dataset to forecast other data points in that same dataset. His example uses a sample from an existing dataset to forecast nonsample data points, but here I will use data from 1993 through 1998 and 1999 and 2000 to forecast actual scores from 1999 to 2001. This should provide some evidence for the relative accuracy of alternative *ex-ante* forecasting methods used in Table 4 and also further highlight the unusual system behavior in 1999.

Table 5 shows that Method J (average yearly change scores from 1993 through 1998 used to predict scores in 1999) substantially underestimates actual scores and again emphasizes the unusually high average scoring increase in 1999. The mean difference between projected scores and actual 1999 scores is –14.2 points compared to mean differences ranging from – 0.1 to 3.0 points for the other methods and time periods. Method M is comparable to Method C presented in Table 4 in that it uses change from 1993 to 1998 and 1999 to 2000 as the trend and 2000 as the base to predict 2001 scores, but does not include the huge increase in 1999 as part of the trend.

TABLE 5
PROJECTIONS OF 1999-2001 ACCOUNTABILITY SCORES

	Method J (1999)	Method K (2000)	Method L (2001)	Method M (2001)
Trend Years	***93-98***	93-99	93-00	93-98+99-00
Avg Yearly Ch	***2.40***	4.80	4.38	2.32
Base Yr for Projection	***1998***	1999	2000	2000
Projected Mean	***50.3 (1999)***	69.5 (2000)	70.9 (2001)	68.7 (2001)
Actual Mean *	***64.7 (1999)***	66.5 (2000)	68.9 (2001)	68.9 (2001)
Mean Difference (s.d.)	***-14.2 (6.1)***	3.0 (4.5)	1.9 (4.5)	- 0.1 (4.4)
# Differences > 0	***13***	835	753	535
# Differences > 5	***3***	352	236	95
# Differences > 10	***1***	42	26	10
# Differences < 0	***1049***	230	313	512
# Differences > -5	***995***	47	70	116
# Differences > -10	***802***	11	12	21
Correlation **	***.79***	.91	.91	.91
N =	***1062***	1066	1067	1047

* Actual mean is for all schools projected from 1993 rather than for all schools reporting scores in each of the projected years (1999-2001) and adjusted 1999 and 2000 scores are used.
** The correlation is between the estimated and actual scores for each year.

When comparing Method M to Method L which includes the large 1999 increase as part of the trend to predict 2001 scores (and is comparable to Method A in Table 4), Method M has a much smaller mean difference between projected and actual 2001 scores (-0.1 vs. 1.9), and has errors more evenly balanced between under and over predictions. These differences show that Method M (comparable to Method C above in Table 2) is the more accurate method for predicting scores in 2001, and therefore also may be the

more accurate method for projecting 2014 scores. Although a simple model, it would be a challenge to derive projections much more accurate than those provided by Method M.

There are other more complex and sophisticated forecasting and quasi-experimental methods that could be applied to these data. For example, the Engineering Statistics Handbook provides excellent discussions of moving average, exponential smoothing, and Box-Jenkins models http://www.itl.nist.gov/div898/handbook/pmc/section4/pmc4.htm. Although various types of causal models could be applied to these data, this analysis is not causal in that it simply projects future behavior of schools based on past behavior rather than on theoretical constructs or characteristics of these schools that may determine performance. Previous research using these same accountability data and other school data in multivariate cross-sectional models finds that school poverty (proportion of children eligible for subsidized meals) is a substantial and consistent determinant of performance controlling for several other plausible determinants. http://www.uky.edu/~proeder/keraweb.htm To provide a rough comparison to these previous findings showing the importance of poverty, using Method C (from table 4) the mean proportion of students eligible for subsidized meals for those schools projected to score over 120 points by 2014 is 45 percent compared to 60 percent for those projected to score less than 80 points by the deadline.

Despite its simplicity, I contend that this analysis using Method C provides a reasonable way to project future accountability behavior taking into account the unusual circumstances occurring in 1999 and 2001, and especially the problem of attempting to forecast far into the future. Testing experts likely disagree over how much of these large increases in1999 (as well as all the testing using the KIRIS and CATS systems) are based on reliable and valid measures of student learning and therefore indicate real improvements in school performance. Regardless of this important question, the data suggest that the policy interventions made in 1999 and 2001 will have a substantial positive impact on the likelihood that many schools will reach the mandated goal of 100 points by 2014, however without another similar intervention, it is likely that no more than half of Kentucky schools will reach the minimum goal by 2014.

Although all three methods depend on assumptions that may or may not be reasonable and leave substantial room for error, especially thirteen years into the future, based on the one-point –ahead projections of actual data in Table 5, I believe Method C presented in Table 4 is the more accurate and realistic way to project scores in 2014. The huge gain in 1999 scores appears to be based more on the policy intervention than on school performance and therefore likely distorts true school performance from 1998 to 1999. I have no other empirical data or methods to support my assumption that the huge gain in 1999 scores is more the result of a policy intervention rather than a true improvement in student and school performance in that one year, however there is little doubt that the pattern of changes in scores from 1998 to 1999 is very different from the changes for every other year in the period under consideration. Consequently, the most likely scenario is that no more than about 500 schools are likely to meet the 2014 standard, assuming that prior to the deadline, the General Assembly and the KDE do not again change the system as they did in 1999 followed by recalculations in scoring as occurred in 2001.

PROJECTING URBAN SCHOOL PERFORMANCE

In this section, the above projection methods will be applied to urban schools in Kentucky, or schools located in the two largest school districts – Jefferson and Fayette Counties. As Table 6 indicates, the behavior of approximately 180 urban schools is similar to all schools in Kentucky. For example, with the 2001 scoring adjustments, the increase from the original 1999 scores to the adjusted 2000 scores is a substantial 5.9 points. Also, the average increase of 11.2 points from 1998 to the original 1999 scores when the system changed from KIRIS to CATS becomes a 15.6 point increase with the adjusted 1999 scores. Of the total average increase of 30 points from 1993 to 2001 (35.8 to 66.2 points), two-thirds or almost 20 points come after 1998. The first five years of accountability for these urban schools show an average total increase of just under 11 points, while the most recent three years including the 1999 system change and the 2001 scoring adjustments show an increase of almost 20 points. It is interesting to note that although almost all 1999 and 2000 scores in Jefferson and Fayette counties were adjusted up in 2001, twenty-six schools were adjusted down (4 schools in Fayette and 22 in Jefferson County). The 2001 scoring adjustments ranged from a decrease of 9.7 points to an increase of 23.3 points.

TABLE 6
KERA ACCOUNTABILITY SCORES OVER TIME FOR URBAN SCHOOLS
(Jefferson and Fayette Counties)

YEAR	N	MEAN	AVG CH/YR	MIN--MAX
1993	181	35.8		19.8--69.8
			5.29	
1994	181	41.1		24.6--76.0
			4.11	
1995	181	45.2		27.4--76.3
			- 3.11	
1996	181	42.2		24.2--73.1
			5.04	
1997	181	47.2		27.6--80.9
			- 0.74	
1998	183	46.6		25.1--77.4
			11.22	
1999*	183	57.8		33.3--86.1
(1999adj)**	182	62.3	15.64 (adj)	35.9--97.4
2000	182	59.0		35.6--87.1
(2000adj)**	183	63.7	1.41 (adj)	39.0--101.0
2001	183	66.2	2.53 (adj)	39.7--99.8

* In 1999, the accountability system changed from KIRIS to CATS.
** In 2001 the accountability scores for 1999 and 2000 were adjusted to reflect changes in standards

Table 7 compares projection methods used previously for all schools in Table 4 and again shows the importance of the change from KIRIS to CATS in 1999 and the

2001 scoring adjustments for the success of urban schools by the 2014 deadline. The table also shows that the projected performance of these urban schools using the three methods is similar to the performance of all Kentucky schools, however the average yearly changes and the projected scores in 2014 for the three projection methods tend to be somewhat lower for urban schools than for all Kentucky schools. As with the data for all schools in Table 4, the simple linear projection from the initial eight years to the next 13 years (Method A) shows the highest proportion of successful schools (125 or just over two-thirds of the urban schools), while Method B which ignores the major system changes after 1998, projects the lowest proportion of successful schools in 2014 (43 or about one fourth of the urban schools).

Projections for urban schools using Method C fall between the other two methods with 59 schools (about one-third) projected to reach the minimum of 100 points by 2014. Recall from Table 4 that this same method projects that about 45 percent of all Kentucky schools will reach the goal. Appendix B lists the urban schools that are projected to reach the minimum performance standard in 2014 using Method C and shows that about 40 percent of Fayette County schools will likely reach the goal, while approximately 30 percent of Jefferson County schools will likely reach the goal. Each of the methods projects that Kentucky's urban schools are likely to be somewhat less successful in achieving the minimum score by the deadline than the rest of Kentucky's schools.

TABLE 7
PROJECTIONS OF 2014 ACCOUNTABILITY SCORES FOR URBAN SCHOOLS*

	METHOD A	METHOD B	METHOD C
Trend Years	1993-2001	1993-1998	1993-1998 +1999-2001
Avg Yearly Change	3.77	2.14	2.09
Base Year for Projection	2001	1998	2001
Mean Score 2014	114.9	80.6	93.2
# Schools 100+ pts in 2014	125	43	59
# Schools 98+ pts in 2014	131	46	64
# Schools 140+ pts in 2014	29	3	3
# Schools < 80 pts in 2014	10	92	54

* N's range from 180 to 182 depending on projection method and using 1999 and 2000 scores as adjusted in 2001.

Recall that Method C accepts that the huge overall gain after 1999 is now part of the baseline, but does not include the unusually large increase when calculating yearly averages used to project future performance. With Method C, the current year 2001 base is accepted (keeping the high scores from 1999 and the adjustments made in 2001 to 1999 and 2000 scores) but the average projected gain from 2000 to 2014 is based on average change from 1993 to 1998 and from 1999 to 2001 (seven instead of eight years). Again, one of the problems with Method A is that many schools are projected to score well above the maximum of 140 points using the linear projection based on the eight-year average from 1993 to 2001. Using Method A, 29 schools are projected to score over 140 points by 2014 with several projected to score over 180 points, while Method C projects

only 3 schools scoring over 140 points. The data and analysis suggest that officials in Fayette and Jefferson County School Districts have much work to do to bring more schools to proficiency by the 2014 deadline.

THE KERA ENDGAME

This research project began with three assumptions - - (1) the performance of individual schools does not change substantially from one year to the next (most yearly changes in accountability scores fall within a limited range), (2) aggregate school performance is moderately to strongly correlated from one year to the next (the rank order of school performance is relatively stable from year to year), and (3) although subject to error, a reasonably accurate projection of future school performance can be made based on past performance. Examination of accountability data finds substantial support for the first two assumptions. More extensive analysis of the third assumption also finds it to be reasonable. Tables 4 and 7 compare methods for projecting school performance far into the future and suggest at least one reasonable projection of future school performance that accounts for the unusual system behavior in 1999 and considers the effects on future performance.

On the surface this analysis may seem to be a superficial exercise in that it projects future school performance based on a somewhat simple model, but the issue of how high to set the performance bar and how much time will be given to school systems to reach the goal has important political and policy implications. Most policy makers and reformers in Kentucky recognized this issue as they developed the accountability system beginning in the early 1990s and revised it in the late 1990s. The key accountability policy dilemma or trade-off relates to setting the ultimate standard or goal. Most would likely agree that the ultimate goal should be high enough to be defensible and challenging for all schools, but not so high that a large proportion of schools fail to meet the minimum goal. The many academic, legal, and political issues in standard-setting are discussed by Viadero (2001).

The major adjustment in the Kentucky system made in 1998/99 (KIRIS to CATS) suggests the bar might have been set too high initially. Since this analysis of Kentucky's accountability standard suggests that without another substantial change in the system, somewhat less than half the schools will fail to meet the minimum goal, one might conclude that the goal still may be too high. Over the next few years, policy makers, educators, citizens, and parents may have to decide if a 50 percent success rate is sufficient to consider KERA a successful education reform.

If making projections of future school behavior based on relatively "hard" data is subject to many potential sources of error, then attempting to predict political, policy, and organizational futures based on these data is an even more hazardous undertaking. Also, as 2014 approaches, the future will become much clearer or at least forecasts will be based on more years of data and experience and therefore are more likely to be accurate. If, as Method C projects, by the middle of this decade, it seems likely that only about 40 to 50 percent of Kentucky's schools will reach proficiency, I believe that policy makers will act as they did in 1998/99 to change the accountability system resulting in substantial increases in baseline scores for most schools. If such an adjustment occurs, then it is likely that as many as 800 or more schools (about two-thirds to three-quarters) will reach proficiency by 2014.

For political and symbolic reasons as well as educational reasons, most policy makers and education reformers will continue to insist that the goal is for all schools to reach proficiency or better, however even with substantial resources, interventions, and adjustments the goal of proficiency for all may not be realistic. Even with another major system change and scoring adjustment in the next decade, as many as 200-300 schools still may not reach the minimal goal, and without another major system change prior to 2014, as many as 500 to 600 schools may not reach the goal. Given these possibilities, what will happen to the schools that do not meet the minimal standard by 2014? Will the state be prepared to take over any of these schools as is happening in Philadelphia, or will some schools simply be allowed to "fail?" Based on KDE reports and publicity, it appears that the Department of Education and many local school districts are working very hard to bring lagging schools to proficiency including scholastic audits and reviews, increased resources, and continued publicity and pressure to improve. Despite these efforts, achieving proficiency may not be possible in some schools and districts without radical changes in governance, leadership, and instructional programs.

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APPENDIX A
SUCCESSFUL SCHOOLS USING THREE FORECASTING METHODS *

	SCORE		PROJECTED SCORE (2014) METHOD		
SCHOOL	1993	2001	A	B	C
ALLEN CO HS	29.1	63.7	120	108	108
ANDERSON CO MID	33.4	74.1	140	101	108
WESTERN EL	41.6	79.7	142	167	108
PAUL G BLAZER HS	39.2	75.7	135	140	123
HAGER EL	40.6	86.2	160	110	121
OAKVIEW EL	36.6	82.5	157	113	135
AUGUSTA EL	21.7	54.4	108	128	100
EASTERN EL	40.9	89.3	168	139	134
RED CROSS EL	34.7	80.3	154	107	132
A M YEALEY EL	42.4	79.8	141	107	117
BURLINGTON EL	41.4	75.6	131	103	108
CONNER MID	38.8	79.6	146	101	117
CONNER HS	33.7	77.7	149	111	126
HILLARD COLLINS EL	35.8	71.3	129	101	114
RYLE HIGH SCHOOL	37.4	77.7	143	114	124
NEW HAVEN EL	38.3	83.6	157	101	129
BOURBON CENTRAL EL	34.2	77.0	147	109	122
PARKER BENNETT EL	20.0	57.4	118	112	104
POTTER GRAY EL	35.7	89.8	178	165	152
BOWLING GREEN HS	37.7	73.3	131	114	123
T C CHERRY EL	31.1	85.9	175	127	156
W R MCNEILL EL	42.5	92.8	175	127	152
BOYLE CO HS	43.3	74.2	124	115	108
BRECKINRIDGE CO HS	34.6	71.7	132	107	110
BULLITT EAST HS	38.4	72.0	127	107	112
FIFTH DISTRICT EL	31.4	80.3	160	154	143
THIRD DISTRICT EL	36.7	80.1	151	113	121
CALDWELL CO HS	27.2	65.5	128	132	117
CALLOWAY CO HS	38.5	71.2	124	110	115
ALEXANDRIA EL	38.1	75.0	135	113	115
GRANTS LICK EL	37.7	87.2	168	105	144
JOLLY EL	37.4	79.3	147	116	125
CAMPBELL COUNTY HS	34.6	69.4	126	109	114
CARLISLE CO HS	45.0	78.9	134	121	125
CARTER EL	25.1	70.0	143	142	136
EAST CARTER CO HS	33.5	61.5	107	123	104
OLIVE HILL EL	31.7	65.4	120	126	110
UPPER TYGART EL	28.1	77.0	156	138	137
PHELPS EL	28.3	73.3	146	114	127
BELMONT EL	24.1	64.6	130	119	127
HOLIDAY EL	33.8	76.8	147	142	126
LACY EL	30.1	65.5	123	117	108
MILLBROOKE EL	31.6	72.0	138	104	115
GEO ROGERS CLARK HS	32.5	68.5	127	117	112
TRAPP EL	33.1	95.2	196	153	168
BIG CREEK EL	29.8	74.6	147	115	155
CLAY CO HS	25.2	56.7	108	154	120
ONEIDA EL	28.8	82.5	170	116	167

WILLIAM H NATCHER EL	34.7	73.9	138	112	107
CRITTENDEN CO MID	41.4	81.7	147	105	118
DANVILLE HS	42.7	74.4	126	146	123
TOLIVER EL	36.3	70.0	125	119	107
APOLLO HS	43.8	77.5	132	131	118
DAVIESS CO HS	38.4	77.6	141	133	128
HIGHLAND EL	43.1	91.5	170	151	140
MASONVILLE EL	47.7	106.9	203	164	190
PHILPOT EL	41.5	89.0	166	107	142
AUDUBON EL	35.0	84.6	165	163	140
TAMARACK EL	40.3	84.8	157	132	123
WEST LOUISVILLE EL	40.0	90.4	172	171	134
WHITESVILLE EL	34.5	84.4	165	114	129
BURNS EL	33.6	80.5	157	125	122
COUNTRY HEIGHTS EL	39.9	89.8	171	126	135
DAWSON SPRINGS HS	38.5	75.3	135	108	106
ELIZABETHTOWN HS	46.8	83.2	142	124	126
ARNETT EL	24.8	79.0	167	179	162
HOWELL EL	32.1	78.0	153	127	148
LLOYD HS	40.5	77.9	139	154	132
ATHENS EL	32.9	81.8	161	137	130
SCAPA AT BLUEGRASS	60.8	98.0	158	115	126
LAFAYETTE HS	43.9	82.1	144	128	127
LANSDOWNE EL	36.4	89.1	175	112	138
TRADITIONAL MAGNET	69.8	97.9	144	102	113
MAXWELL EL	31.8	92.4	191	112	133
STONEWALL EL	44.0	88.1	160	108	130
TATES CREEK HS	39.2	75.0	133	105	110
CLAYS MILL EL	39.1	93.0	181	126	134
MEADOWTHORPE EL	47.8	87.8	153	139	138
P L DUNBAR HS	44.5	84.2	149	149	136
CHARLES CLARK EL	27.5	71.0	142	109	111
JOHNSON EL	48.2	94.5	170	141	127
MOYER EL	49.2	86.6	147	108	102
FRANKFORT HIGH SCHOOL	38.2	71.7	126	136	105
FRANKLIN CO HS	36.3	70.0	125	115	110
HEARN EL	34.4	78.5	150	100	117
WESTERN HILLS HS	35.2	71.0	129	122	113
GARRARD CO HS	31.6	63.3	115	107	100
PAINT LICK EL	30.8	80.0	160	128	146
E B TERRY EL	34.8	68.9	124	121	114
GLASGOW HS	35.3	80.8	155	158	143
HAPPY VALLEY EL	32.4	85.4	172	128	140
SOUTH GREEN EL	33.2	80.1	156	140	135
CRITTENDEN MT ZION EL	27.7	71.6	143	142	127
DRY RIDGE EL	30.8	74.7	146	145	124
GRANT CO HS	31.9	69.5	131	113	122
MASON CORINTH EL	38.1	80.2	149	115	136
CUBA EL	41.1	82.5	150	116	132
FANCY FARM EL	42.4	86.5	158	110	130
SEDALIA EL	36.0	82.2	157	135	146
WINGO EL	33.5	83.2	164	127	142
H W WILKEY EL	35.0	75.2	141	106	115
CANEYVILLE EL	33.0	77.1	149	121	127
HANCOCK CO HS	37.3	73.3	132	122	117
HAWESVILLE EL	40.8	84.2	155	112	122
G C BURKHEAD EL	36.5	72.8	132	111	107

SONORA EL	37.2	72.1	129	123	116
UPTON EL	30.9	76.7	151	122	156
WESTERN EL	39.2	64.9	107	109	105
CENTRAL HARDIN HS	35.8	68.6	122	112	110
CAWOOD EL	27.9	65.6	127	102	105
NORTHSIDE EL	40.1	86.0	161	174	138
HAZARD HS	35.9	68.0	120	129	110
BEND GATE EL	34.8	71.3	131	107	112
CAIRO EL	31.4	70.6	134	120	112
HENDERSON CO HS	33.9	69.7	128	110	124
NIAGARA EL	33.5	72.9	137	110	105
NEW CASTLE EL	32.8	72.4	137	117	105
PRIDE AVENUE EL	28.4	74.5	149	112	127
WEST BROADWAY EL	42.0	79.6	141	105	113
EASTERN HS	39.6	72.9	127	108	117
FERN CREEK EL	37.8	80.0	149	113	119
FERN CREEK HS	22.9	63.4	129	119	118
GREATHOUSE SHRY EL	53.6	93.8	159	102	123
ROBERTA TULLY EL	45.4	84.7	149	105	117
AUDUBON TRAD EL	45.8	91.9	167	133	135
BUTLER TRAD HS	33.5	79.7	155	139	135
MALE HS	46.3	90.5	162	153	140
SCHAFFNER TRAD EL	41.6	88.6	165	114	137
WILDER EL	47.9	82.1	138	108	101
SENECA HS	37.9	70.5	123	133	117
INDIAN TRAIL EL	32.6	68.5	127	111	113
CRUMS LANE EL	24.7	65.5	132	105	124
BOWEN EL	35.2	75.1	140	109	129
HITE EL	38.0	85.3	162	133	134
MINORS LANE EL	25.0	81.5	173	136	160
BALLARD HS	44.5	81.3	141	146	135
GUTERMUTH EL	25.7	59.8	115	104	110
LAYNE EL	31.9	64.5	117	113	116
LOWE EL	38.4	89.3	172	112	134
DUNN EL	44.2	79.9	138	113	113
DUPONT MANUAL HS	51.2	94.5	165	134	139
BRANDEIS EL	36.6	80.8	153	115	124
WILMORE EL	39.5	84.8	158	127	126
BEECH GROVE EL	36.2	73.2	133	116	117
R C HINSDALE EL	41.2	86.2	159	116	124
FT WRIGHT EL	33.4	75.7	144	122	121
PINER EL	28.8	71.6	141	115	119
TAYLOR MILL EL	39.8	79.0	143	112	104
SCOTT HS	42.3	72.2	121	102	112
LARUE CO HS	34.5	67.6	121	113	107
BUSH EL	36.7	78.0	145	106	127
COLONY EL	35.5	69.3	124	104	104
SOUTH LAUREL HS	35.1	72.9	134	152	134
LAUREL EL	33.4	75.9	145	117	128
LIVINGSTON CENTRAL HS	29.6	66.5	126	127	107
ADAIRVILLE EL	28.4	80.2	164	135	135
AUBURN EL	37.2	77.4	143	101	125
MARY A GOETZ EL	36.7	85.0	163	126	147
LUDLOW HS	41.5	85.7	158	113	137
KINGSTON EL	27.5	66.0	129	105	115
KIT CARSON EL	41.5	81.5	147	108	116
WHITE HALL EL	38.2	77.1	140	109	111

MILLARD HENSLEY EL	26.5	81.8	172	173	149
PRATER BORDERS EL	36.5	68.9	122	125	112
SALYER EL	29.4	73.7	146	100	136
WEST MARION EL	47.2	91.4	163	108	131
MASON CO HS	36.6	69.1	122	100	103
MAYFIELD HS	39.7	69.9	119	103	108
SPARKS EL	33.0	66.8	122	105	102
LONE OAK HS	30.7	74.6	146	150	135
STEARNS EL	32.8	68.9	128	124	113
CALHOUN EL	31.5	86.1	175	132	129
MCLEAN CO HS	29.7	65.1	123	125	106
EKRON EL	34.4	81.2	157	125	128
MEADE CO HS	37.2	71.0	126	114	105
MULDRAUGH EL	25.7	73.0	150	139	158
BOTTS EL	39.9	73.8	129	107	101
METCALFE CO HS	31.0	63.9	117	114	111
SUMMER SHADE EL	33.7	73.4	138	133	106
GAMALIEL EL	28.4	69.3	136	181	164
MONROE CO MIDDLE	33.6	69.0	127	106	106
JOE HARRISON CARTER EL	24.7	74.3	155	140	147
TOMPKINSVILLE EL	35.2	70.0	127	125	117
MONROE COUNTY HS	29.2	65.8	125	134	127
CAMARGO EL	30.9	66.9	125	118	113
MAPLETON EL	32.9	75.2	144	117	111
MONTICELLO HS	27.4	66.7	131	111	112
EZEL EL	37.5	88.9	172	133	153
WRIGLEY EL	39.0	91.1	176	152	161
CENTRAL CITY EL	38.9	84.6	159	122	123
GREENVILLE EL	35.5	76.9	144	153	124
DRAKESBORO CONSOL EL	38.1	78.5	144	129	132
HUGHES KIRK EL	31.6	71.4	136	129	119
LONGEST EL	32.2	79.9	157	138	128
MUHLENBERG NORTH HS	30.3	65.6	123	149	112
MUHLENBERG SOUTH HS	33.1	69.0	127	128	117
MURRAY HS	43.6	75.1	126	132	116
BOSTON EL	37.9	82.2	154	111	129
CHAPLIN EL	27.6	70.8	141	173	137
ELI H BROWN JR EL	28.6	70.3	138	107	107
MILDRED DEAN EL	29.4	75.1	149	116	118
NEWPORT HS	24.7	59.9	117	120	107
BEAVER DAM EL	36.6	70.7	126	112	107
OHIO CO HS	35.4	67.2	119	119	105
CENTERFIELD EL	39.7	97.6	192	143	151
GOSHEN ELEMENTARY	48.1	106.2	201	152	166
LAGRANGE EL	42.2	75.1	129	118	121
OLDHAM CO HS	42.5	79.9	141	102	110
OLDHAM CO MID	44.8	89.2	161	117	127
SOUTH OLDHAM HS	41.3	83.6	152	137	136
OWEN CO HS	36.2	70.0	125	116	105
CRAVENS ELEM	32.5	75.0	144	123	120
ESTES ELEM	36.2	75.0	138	111	113
FOUST ELEMENTARY	29.3	75.0	149	133	126
NEWTON PARRISH EL	39.1	75.0	133	102	108
OWENSBORO HS	36.1	69.1	123	109	109
SEVEN HILLS EL	39.4	75.0	133	101	107
CLARK EL	45.5	79.5	135	109	118
PADUCAH TILGHMAN HS	31.5	71.1	135	126	120

PAINTSVILLE EL	44.2	82.2	144	104	113
DENNIS C WOOTON EL	28.6	74.3	149	108	123
BELFRY HS	27.9	63.7	122	115	118
FEDS CREEK HS	34.7	62.5	108	109	101
GEORGE F JOHNSON EL	40.6	92.6	177	129	156
JOHNS CREEK EL	30.6	73.0	142	123	121
SHELBY VALLEY HS	31.4	63.5	116	120	111
PINEVILLE HS	29.3	68.7	133	112	118
BOWEN EL	29.7	97.7	208	136	156
CLAY CITY EL	32.5	78.0	152	125	126
PULASKI EL	33.7	75.4	143	106	133
WOODSTOCK EL	26.5	72.8	148	132	129
SOUTHERN EL	33.4	63.3	112	104	106
DEMING HS	28.9	62.3	117	105	106
ROCKCASTLE CO HS	31.3	65.5	121	117	107
CLEARFIELD EL	38.5	77.3	140	104	112
RUSSELL SPRINGS EL	35.5	77.2	145	106	126
RUSSELL CO HS	35.2	68.3	122	117	112
SALEM EL	36.1	84.6	163	109	127
RUSSELL HS	39.4	72.5	126	114	109
RUSSELLVILLE HS	43.1	70.7	116	117	109
SCOTT CO SR HS	34.1	67.0	120	109	104
MANNSVILLE EL	28.0	74.0	149	107	120
NORTH TODD EL	31.7	69.7	131	100	112
SOUTH TODD EL	27.7	70.6	140	109	124
MILTON EL	34.0	75.3	142	127	123
UNION CO HS	37.6	68.3	118	123	103
WALTON VERONA EL	36.1	88.4	173	137	152
WALTON VERONA HS	39.2	85.3	160	138	142
ALVATON EL	36.6	79.0	148	108	120
OAKLAND EL	33.0	76.1	146	105	150
WARREN CENTRAL HS	38.0	65.9	111	119	103
GREENWOOD H S	41.6	80.5	144	112	118
WEBSTER CO HS	29.3	68.8	133	133	122
POPLAR CREEK EL	25.4	70.7	144	105	123
WILLIAMSBURG EL	36.9	73.4	133	126	104
WILLIAMSTOWN EL	36.0	79.9	151	104	130
ROGERS EL	33.3	79.3	154	132	122
SOUTHSIDE EL	39.8	82.4	152	126	121
HUNTERTOWN EL	34.7	81.3	157	131	122
MODEL LAB EL	48.4	82.8	139	103	109
MODEL LAB HS	52.6	84.3	136	117	118

* These are the 269 schools that operated in 1993, continued through 2001, and are projected to reach the minimum goal of 100 points using all three methods. These projections use the 1999 and 2000 accountability scores as adjusted in 2001.

APPENDIX B
PROJECTED SUCCESSFUL URBAN SCHOOLS *

SCHOOL	SCORES 1993	2001	2014
ATHENS EL	32.9	81.8	129.9
SCAPA AT BLUEGRASS	60.8	98.0	126.0
CASSIDY EL	50.5	88.9	124.2
JULIA R EWAN EL	38.0	73.8	100.4
LAFAYETTE HS	43.9	82.1	127.0
LANSDOWNE EL	36.4	89.1	137.6
TRADITIONAL MAGNET	69.8	97.9	112.9
LINLEE EL	26.4	69.0	125.1
MAXWELL EL	31.8	92.4	133.4
SQUIRES EL	39.6	74.4	102.3
STONEWALL EL	44.0	88.1	130.4
RUSSELL EL	25.8	64.8	118.7
TATES CREEK HS	39.2	75.0	110.5
CLAYS MILL EL	39.1	93.0	134.0
GLENDOVER EL	49.6	83.4	104.9
MEADOWTHORPE EL	47.8	87.8	137.6
BRYAN STATION HS	31.3	62.2	101.0
MARY TODD EL	28.3	57.7	102.1
P L DUNBAR HS	44.5	84.2	136.2
EASTERN HS	39.6	72.9	117.1
FERN CREEK EL	37.8	80.0	119.2
FERN CREEK HS	22.9	63.4	117.6
GREATHSE SHRY TRAD EL	53.6	93.8	123.1
ROBERTA TULLY EL	45.4	84.7	116.6
BARRET MID	49.3	84.4	106.5
AUDUBON TRAD EL	45.8	91.9	135.0
BUTLER TRAD HS	33.5	79.7	134.5
MALE HS	46.3	90.5	140.1
GILMORE LANE EL	30.4	69.9	118.7
GOLDSMITH LANE EL	36.6	66.0	101.5
SCHAFFNER TRAD EL	41.6	88.6	136.9
ST MATTHEWS EL	41.8	80.8	111.3
WILDER EL	47.9	82.1	100.9
SENECA HS	37.9	70.5	117.5
INDIAN TRAIL EL	32.6	68.5	114.0
Z TAYLOR EL	42.7	76.2	105.5
KERRICK EL	43.1	76.7	113.5
CRUMS LANE EL	24.7	65.5	123.6
BOWEN EL	35.2	75.1	129.1
HITE EL	38.0	85.3	133.8
NORTON EL	49.4	81.1	103.2
MINORS LANE EL	25.0	81.5	160.2
BALLARD HS	44.5	81.3	135.3
LUHR EL	34.7	66.3	102.1
GUTERMUTH EL	25.7	59.8	110.1
LAYNE EL	31.9	64.5	116.3
LOWE EL	38.4	89.3	134.1
MILL CREEK EL	26.0	63.9	110.7
DUNN EL	44.2	79.9	113.1
JEFFERSONTOWN EL	35.3	71.8	124.2
DUPONT MANUAL HS	51.2	94.5	138.7

ENGELHARD EL	24.9	78.0	146.9
BRANDEIS EL	36.6	80.8	123.5
BROWN EL	47.6	77.5	101.5
BROWN HS	45.2	77.5	105.9
FOSTER EL	24.7	65.8	111.1
MCFERRAN EL	35.2	71.8	109.5
L T JOHNSON TRAD MS	34.2	73.5	106.0
CARTER TRAD EL	40.7	88.6	130.6

* These are the 59 urban schools that operated in 1993, continued through 2001, and are projected to reach the minimum score of 100 by 2014 using Method C. These projections use 1999 and 2000 accountability scores as adjusted in 2001.

APPENDIX C
TIMELINE FOR KENTUCKY'S ACCOUNTABILITY POLICIES AND SYSTEMS

MARCH 1997
A Task Force begins an examination of the existing KIRIS accountability system including contentious issues such as use of a national standardized or norm-referenced test along with or instead of the "custom-made" tests based on Kentucky specific content and standards, use of rewards as salary bonuses to staff and types of school sanctions, and whether each school should have a fixed improvement goal.

DECEMBER 1997
The Task Force issues a report for the 1998 session of the General Assembly that recommends use of some type of national test, increased emphasis on basic academic skills, simplifying school achievement goals, cash rewards not be used as bonuses for teachers, and development of a school report card. (Harp, Lonnie, December 10, 1997. Task Force Urges Changes in KERA Test. Louisville Courier-Journal)

JANUARY 1998
A report from a group of national testing experts commissioned by the Legislative Research Commission is critical of the KIRIS accountability system. Based on an audit of the scoring system, the panel concludes that the scoring index inflates actual scores and scores prior to 1996 be used for information only. The panel recommends that a process be initiated to reestablish a baseline year and reset standards as soon as possible. (Blackford, Linda. January 11, 1998. Toss Out Early Scores on KIRIS Tests and Start Over, Experts Say. Lexington Herald-Leader)

MAY 1998
The General Assembly approves HB 53 requiring that the new Commonwealth Accountability Testing System (CATS) include a norm-referenced test that matches Kentucky's core content and provides valid and reliable results for the individual student, open-response and multiple-choice items, writing portfolios but with reduced time for students and teacher involvement, extensive involvement of teachers in designing and scoring the new test, and other components. The legislation also requires the establishment of a school report card, reconfigures the consequences section of accountability, and requires the State Board to school to establish a new formula for accountability and improvement.

MAY 1998
A group of legislators, educators and citizens (School Curriculum, Assessment, and Accountability Council) is appointed to advise the state School Board on further development of a new state testing system. The group is to have a design for a new test recommended to the state board in time to meet a June 15 deadline for seeking bids on the test. Issues to be addressed include whether the test should be designed to provide reliable scores for individuals students, schools, or both; the mix of multiple-choice and essay questions; and how much of the test is to be customized for Kentucky or consist of national standardized test items. (Harp, Lonnie, May 13, 1998. Group tackles State Testing Redesign Issues. Louisville Courier-Journal)

JUNE 1998
Board approves RFP for proposals to build a new accountability test.

SEPTEMBER 1998
CTB/McGraw Hill awarded four-year $30 million contract by Board of Education to design and score CATS as the replacement for KIRIS accountability system.

OCTOBER 1998
The Commissioner of Education cites improvements in the CATS system. The development process was collaborative (teachers, parents, administrators, testing experts, etc.); the test is more reliable and valid; testing will take less time; results will be reported sooner; results can be used to measure the progress of individual students over time; and the contractor has resources and a proven track record. (Commissioner's Comments, Kentucky Teacher, October 1998)

DECEMBER 1998
The state school board proposes a new system to evaluate and classify schools. A straight line or "line of expected growth" is plotted for each school showing how it must progress from 2000 to reach the goal of 100 points by 2014. If two-year interim goals on the straight line are met or exceeded, the school receives cash rewards (to receive rewards, schools also must meet additional standards for reducing drop-out rates and decreasing the number of students scoring in the novice category). Schools with lower scores will have steeper lines than schools with higher schools, but all schools will have a safety zone under the line that allows them to slip a few points without sanctions. Every two years, a school will be classified as meeting its goal, progressing, or needing assistance. Some schools in the progressing range may receive partial awards, and schools falling below the assistance line may be eligible for a "scholastic audit" to determine the type of assistance needed.

FEBRUARY 1999
Based on recommendations from The National Technical Advisory Panel on Assessment and Accountability and WestEd, the assessment subcontractor for the Kentucky Core Content Tests that the core content be reviewed prior to the development of new questions, committees begin benchmarking (aligning to national standards) in five content areas

APRIL 1999
The first CATS test is taken

AUGUST 2001
Recalculated scores for 1999 and 200 are released in the form of "growth charts" for each individual school. A model or example of the growth chart with terms used can be viewed at http://www.kde.state.ky.us/comm/commrel/cats/long_term.asp

New performance standards are found at
http://www.kde.state.ky.us/comm/pubinfo/standards/

The various components of the CATS testing system and the grades where each is administered are described in the table below.

CATS STUDENT TESTING MATRIX										
	STUDENT GRADE									
TEST	3	4	5	6	7	8	9	10	11	12
Norm Referenced Test *	X			X			X			
Reading		X			X			X		
Math			X			X			X	
Science		X			X				X	
Social Studies			X			X			X	
Writing		X			X					X
Arts & Humanities			X			X			X	
Practical Living & Vocat			X			X		X		
* The norm referenced test is CTBS/5										

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